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Covid-19 and its impact on education, social life, and mental health among medical students in Saudi Arabia

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ABSTRACT

Background: As COVID-19 pandemic reached Saudi Arabia, emergency disaster protocols were implemented to control the spread of the virus, which resulted in limitations on all public movements, including the closure of educational institutes. This study aimed to evaluate the impact of COVID-19 on education, social life, and mental health among medical students during COVID-19 restrictions. **Methods:** A cross-sectional study with a sample size of 1253 medical students from various universities in different regions in Saudi Arabia was conducted. Survey data were obtained from social media platforms using web-based self-administered questionnaires. **Results:** This study revealed large acceptance of online classes (64.1% of students), however, students reported less opportunities to both collaborate with colleagues, and ask questions during online classes. Improved student's education skills including time management, self-monitoring for academic progress, access and using different types of information sources, and multitasking was demonstrated. Regarding effect of COVID-19 on students' social and habitual life, 52.9% reported satisfaction with utilization of their time, however, 52% stated socially not well connected, 36.3% never engage in physical activity, 42.4% reported increased body weight, and only 25% were able to sleep as usual. Social media platforms were at the fore front in using to overcome loneliness feeling and communicate with others. **Conclusions:** Positive impact of COVID-19 on education was demonstrated in terms of the large acceptance of online classes and improvement of education skills. However, negative impact on social life was established including poor social communication, disturbed sleep habits and poor engagement in physical activity.

Keywords: COVID-19, education, impact, mental health, social life



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1. INTRODUCTION

COVID-19 is a disease created by a new coronavirus called SARS-CoV-2. WHO first discovered this new virus on 31 December 2019, following a description of a cluster of 'viral pneumonia' in Wuhan, People's Republic of China; the usual common symptoms of COVID-19 are fever and dry cough, fatigue (World Health Organization, 2020). After the virus spread widely in the world and reached the virus to Saudi Arabia, emergency disaster protocols implemented to control the spread of the virus, which resulted in limitations on all public movements, including the closure of educational institutes, the requirement for a rapid transition from physical education to the digital sphere of learning emerged. Online learning has been seen as a likely alternative to conventional learning (Chaturvedi et al., 2021; Abdelgeleel et al., 2021). This fast progression at such a large scale has influenced the students of all age groups (Hasan & Bao, 2020). It is probable that the continuous spread of the disease and the closure of educational institutions across the country would have a substantial consequence on the education, social life, and mental health of students (Odriozola-gonzález et al., 2020; Eid et al., 2021).

The aim of the current study was to evaluate the impact of COVID-19 on the medical students in different regions in Saudi Arabia, targeting different parameters including education, sleeping habits, daily fitness routine, mental health, and social support.

2. MATERIALS AND METHODS

A cross-sectional study was conducted at the end of the second semester of the academic year 2020/2021 between April 1, 2021, and July 22, 2021. Undergraduate medical students at all medical schools in Saudi Arabia were invited to participate in this study to evaluate the impact of COVID-19 restrictions on the medical students in the Western, Eastern, Central, Southern and Northern regions in Saudi Arabia, targeting different parameters including education, sleeping habits, daily fitness routine, mental health, and social support.

The sample size was calculated using the Raosoft sample size. Sample sizes of 376 or more measurements/surveys were needed to have a confidence level of 95% that the real value is within $\pm 5\%$ of the measured/surveyed value. However, 1253 completed surveys were obtained. The data was obtained from social media (Twitter, WhatsApp, and Telegram) using web-based self-administered questionnaire consisting of closed-ended questions using the Googleforms web.

A questionnaire regarding COVID-19 impact on education, social life, and mental health was used for data collection. It contained 23 multiple-choice questions, divided into four main parts:

Part 1: Personal characteristics such as age, region, and year of study. Interns are those students who were recently graduated, and their second semester of the last year of their undergraduate education was online only learning.

Part 2: Assessment of online learning including average time spent on online classes and self-study, satisfaction level for online courses, opportunities to collaborate with colleagues and ask questions, understand course requirements, and effect of online classes on students' grades. This section also assessed student's report in improvement in their education skills including Time managements, Self-monitor of my academic progress, Access and using different types of information sources, multi-tasking. Multi-tasking refers to the ability to prioritize and perform simultaneous tasks and focus on the task in hand (Salvucci et al., 2009).

Part 3: Assessment of social life and health related to lifestyle changes in different aspects including social communication, utilization of time, engagement in physical activity, change in body weight, and sleep duration and pattern. Preferred social media platform and time spent on social media were also assessed.

Part 4: Assessed stress feeling, and methods to relieve stress and sense of loneliness.

The questionnaire was pilot tested with 50 participants, who were included in the results.

Adherence to ethical recommendations

An institutional review board approval number HAP0-02-K-012-2021-04-663, was obtained from the Biomedical Research and Ethics committee of Umm Alqura University Faculty of Medicine. Informed consent was obtained from participants after being informed of the purpose, and benefits of the study. The authors declare adherence to ethical recommendations throughout the work. Participants' information was kept confidential and will not be breached.

Statistical analysis

The data were collected, reviewed, and then fed to Statistical Package for Social Sciences version 21 (SPSS: IBM Company). All statistical methods used were two tailed with alpha level of 0.05 considering significance if P value less than or equal to 0.05. Descriptive analysis was done by prescribing frequency distribution and percentage for study variables including students' bio-

demographic data including age, gender, academic year, and medical history. Other data including COVID-19 and its impact on education, social life, and mental health among medical students in Saudi Arabia were also described.

Cross tabulation for showing distribution of COVID-19 and its impact on education, social life, and mental health among medical students in Saudi Arabia by students' academic year was done. Significance of relations was tested with Pearson chi-square test and exact probability test for significance due to small frequency distributions.

3. RESULTS

A total of 1253 medical students completed the study questionnaire. There were 470 (37.5%) respondents from Western region, 253 (20.2%) respondents from Eastern region, 203 (16.2%) from Central region, 197 (15.7%) from Northern region, and 130 (10.4%) from Southern region. Medical students' ages ranged from 18 to 25 years with mean age of 21.8 ± 1.7 years old. Exact of 496 (39.6%) participants were at their pre-clinical years (1st to 3rd), 653 (52.1%) were at their clinical years, and 104 (8.3%) were medical interns. Exact of 239 (19.1%) students had medical health problems (table 1).

Table 1 Personal characteristics of responding medical students, Saudi Arabia

Personal Data	No	%
Region		
<i>Central region.</i>	203	16.2%
<i>Eastern region.</i>	253	20.2%
<i>Northern region.</i>	197	15.7%
<i>Southern region.</i>	130	10.4%
<i>Western region.</i>	470	37.5%
Age in years		
<i>18-19</i>	119	9.5%
<i>20-21</i>	443	35.4%
<i>22-23</i>	495	39.5%
<i>24+</i>	196	15.6%
Academic year		
<i>Pre-clinical</i>	496	39.6%
<i>Clinical</i>	653	52.1%
<i>Intern</i>	104	8.3%
Did you have any health issues?		
<i>Yes</i>	239	19.1%
<i>No</i>	1014	80.9%

Table 2 illustrates distribution of online study and students' satisfaction during COVID-19 among medical students, Saudi Arabia. Exact of 49.7% of the medical students spent 4-7 hours on online classless during covid-19 pandemic which was significantly more among students at the clinical years (52.8%) and lowest among interns (35.6%) with statistical significance ($p=0.001$). Also, 33.1% of the study students spent 4-7 hours on self-study which was higher among students at pre-clinical years (36.7%) compared to 24% of the medical interns ($p=0.017$). As for student's satisfaction level for online classes during the pandemic, 64.1% were highly satisfied (good to excellent) which was higher among medical interns (68.3%) compared to 60.7% of students at pre-clinical years ($p=0.010$). Exact of 44.3% of the students agreed on having more opportunities to collaborate with their colleagues during online classes which was more among medical interns (49%) in comparison to 40.3% of students at their pre-clinical years with no statistical significance. Also, 52.2% of the students agreed on that online class help them to understand course requirements with no significant difference according to their academic year ($p=0.862$). Exact of 52.3% of the students were more likely to ask questions during online classes which was reported among 56.8% of interns compared to 48.8% of students at pre-clinical years ($p=0.084$). Having higher grades during online classes was reported among 55% of the study students which was higher among 72% of medical interns in comparison to 50.8% of students at their pre-clinical years ($P=0.009$).

Table 2 Students' satisfaction with online classes during covid-19 pandemic among medical students, Saudi Arabia

Online study data		Total		Academic year						p-value
				Pre-clinical		Clinical		Intern		
		No	%	No	%	No	%	No	%	
Average Time spent on online classes	0-2 hours	97	7.7%	32	6.5%	45	6.9%	20	19.2%	.001*0
	2-4 hours	272	21.7%	98	19.8%	139	21.3%	35	33.7%	
	4-7 hours	623	49.7%	241	48.6%	345	52.8%	37	35.6%	
	> 7 hours	261	20.8%	125	25.2%	124	19.0%	12	11.5%	
Average Time spent on self-study	0-2 hours	146	11.7%	68	13.7%	64	9.8%	14	13.5%	.017*0
	2-4 hours	391	31.2%	134	27.0%	216	33.1%	41	39.4%	
	4-7 hours	415	33.1%	182	36.7%	208	31.9%	25	24.0%	
	> 7 hours	301	24.0%	112	22.6%	165	25.3%	24	23.1%	
Satisfaction level for online classes	Very poor	53	4.2%	29	5.8%	19	2.9%	5	4.8%	0.010*
	Poor	249	19.9%	117	23.6%	114	17.5%	18	17.3%	
	Average	147	11.7%	49	9.9%	89	13.6%	9	8.7%	
	Good	528	42.1%	198	39.9%	277	42.4%	53	51.0%	
	Excellent	276	22.0%	103	20.8%	154	23.6%	19	18.3%	
There are more opportunities to collaborate with my colleagues during online classes	Disagree	191	15.2%	77	15.5%	103	15.8%	11	10.6%	.2190
	Somewhat disagree	258	20.6%	109	22.0%	132	20.2%	17	16.3%	
	Neutral	248	19.8%	110	22.2%	113	17.3%	25	24.0%	
	Somewhat agree	340	27.1%	124	25.0%	185	28.3%	31	29.8%	
	Agree	216	17.2%	76	15.3%	120	18.4%	20	19.2%	
Online classes help me to understand course requirements	Disagree	162	12.9%	66	13.3%	82	12.6%	14	13.5%	.8620
	Somewhat disagree	216	17.2%	90	18.1%	105	16.1%	21	20.2%	
	Neutral	220	17.6%	78	15.7%	126	19.3%	16	15.4%	
	Somewhat agree	409	32.6%	164	33.1%	213	32.6%	32	30.8%	
	Agree	246	19.6%	98	19.8%	127	19.4%	21	20.2%	
I am more likely to ask questions during online classes	Disagree	230	18.4%	109	22.0%	107	16.4%	14	13.5%	.0840
	Somewhat disagree	214	17.1%	83	16.7%	107	16.4%	24	23.1%	
	Neutral	153	12.2%	62	12.5%	84	12.9%	7	6.7%	
	Somewhat agree	351	28.0%	126	25.4%	193	29.6%	32	30.8%	
	Agree	305	24.3%	116	23.4%	162	24.8%	27	26.0%	
I get higher grades during online classes	Disagree	191	15.2%	75	15.1%	108	16.5%	8	7.7%	.009*0
	Somewhat disagree	140	11.2%	63	12.7%	70	10.7%	7	6.7%	
	Neutral	233	18.6%	106	21.4%	111	17.0%	16	15.4%	
	Somewhat agree	307	24.5%	123	24.8%	155	23.7%	29	27.9%	
	Agree	382	30.5%	129	26.0%	209	32.0%	44	42.3%	

* $P < 0.05$ (significant)

Table 3 shows effect of online study and students' skills during COVID-19 among medical students, Saudi Arabia. Exact of 62.3% of the students reported that online classes during covid-19 pandemic helped to improve their skills in access and using different types of information sources, 56.8% improved their time management, 53.3% improved self-monitor of academic progress, and 55.7% improved skills of multitasking. Multitasking was significantly higher among clinical years students than others ($p = 0.048$).

Table 3 Effect of online study and students' skills during covid-19 among medical students, Saudi Arabia

The online classes help me improve my skills in:	Total		Academic year						p-value
			Pre-clinical		Clinical		Intern		
	No	%	No	%	No	%	No	%	
Time managements	712	56.8%	265	53.6%	385	58.9%	62	62.5%	.3350
Self-monitor of my academic progress	667	53.3%	261	52.8%	349	53.4%	57	54.8%	.8540
Access and using different types of information sources	780	62.3%	308	62%	402	61.7%	70	67.3%	.3390
Multitasking	698	55.7%	242	48.8%	401	61.4%	55	52.8%	.048*0
Others	3	.2%0	2	.4%0	1	.2%0	0	0.0%	.8150

P: Adjusted exact probability test for multiple comparisons

* $P < 0.05$ (significant)

Table 4 shows effect of COVID-19 on medical students' social and habitual life. Body weight of 42.4% of the students was increased during quarantine of covid-19 pandemic. Increased weight was not significantly different by their academic years. Exact of 33.8% reported no change in their weight. Also, 52.9% of the students were satisfied with the utilization of their time during quarantine period. It was significantly higher among medical interns than others (59.6%) ($p=0.001$). Also, 52% of the students reported that they found themselves socially not well connected during covid-19 quarantine especially the pre-clinical years students (59.5%); compared to other students; $p=0.005$. More than third of students (36.3%) never engaged in physical exercise during quarantine while almost one third (29.1%) of them did physical exercises for 1-2 days weekly. As regard sleep, while 44.9% of students reported average sleeping for 6-8 hours, one fourth of students (25.6%) slept for as long 8-11 hours daily, and 4.5% slept longer than 11 hours. Another fourth of students (25%) reported insufficient sleep hours (4-6 hours). Regarding sleeping pattern, only 25% of students reported their ability to sleep as usual, while 31% of the students reported sleeping late, and 22.1% suffered difficulty to initiate sleep.

Table 4 Effect of covid-19 on students' social and habitual life among medical students, Saudi Arabia

Social life		Total		Academic year						p-value
				Pre-clinical		Clinical		Intern		
		No	%	No	%	No	%	No	%	
Change in body weight	Increased	531	42.4%	207	41.7%	277	42.4%	47	45.2%	.8440
	No change	423	33.8%	168	33.9%	218	33.4%	37	35.6%	
	Decreased	299	23.9%	121	24.4%	158	24.2%	20	19.2%	
Are you satisfied with the utilization of your time?	Yes	663	52.9%	231	46.6%	370	56.7%	62	59.6%	.001*0
	No	590	47.1%	265	53.4%	283	43.3%	42	40.4%	
Did you find yourself socially well connected?	Yes	602	48.0%	201	40.5%	347	53.1%	54	51.9%	.005*0
	No	651	52.0%	295	59.5%	306	46.9%	50	48.1%	
How many days do you do	1-2 days	365	29.1%	150	30.2%	175	26.8%	40	38.5%	.0710
	3-5 days	331	26.4%	133	26.8%	170	26.0%	28	26.9%	

physical exercises per week?	Every day	102	8.1%	46	9.3%	48	7.4%	8	7.7%	.2630
	Never	455	36.3%	167	33.7%	260	39.8%	28	26.9%	
Average time spent on sleep	11-15 hours	57	4.5%	28	5.6%	24	3.7%	5	4.8%	
	4-6 hours	313	25.0%	137	27.6%	156	23.9%	20	19.2%	
	6-8 hours	562	44.9%	213	42.9%	297	45.5%	52	50.0%	
	8-11 hours	321	25.6%	118	23.8%	176	27.0%	27	26.0%	
Sleep patterns	Difficulty initiate sleep	208	16.6%	80	16.1%	110	16.8%	18	17.3%	
	Insomnia	107	8.5%	49	9.9%	53	8.1%	5	4.8%	
	Sleep as usual	313	25.0%	111	22.4%	175	26.8%	27	26.0%	
	sleep early	93	7.4%	35	7.1%	50	7.7%	8	7.7%	
	sleep late	388	31.0%	155	31.3%	200	30.6%	33	31.7%	
	Wake up early	64	5.1%	31	6.3%	29	4.4%	4	3.8%	
	Wake up late	80	6.4%	35	7.1%	36	5.5%	9	8.7%	

* $P < 0.05$ (significant)

Table 5 illustrates preferred and used social media platforms among medical students during covid-19 pandemic, Saudi Arabia. The most preferred social media during quarantine period was twitter (50.8%), followed by YouTube (49.6%), WhatsApp (47.6%), and Instagram (40.9%) while the least preferred was Tiktok (2.5%). Using social media platforms for 2-4 hours daily was reported by 46.9% of the students and for 5-7 hours among 27.9% while 14.4% used for more than 7 hours daily. The higher utilization hour was more among medical interns than others ($P=0.032$).

Table 5 Preferred social media among medical students during covid-19 pandemic, Saudi Arabia

Social media	Total		Academic year						p- value
			Pre-clinical		Clinical		Intern		
	No	%	No	%	No	%	No	%	
What is your preferred social media platform?									
WhatsApp	596	47.6%	231	46.6%	312	47.8%	53	51.0%	.001*0
Facebook	61	4.9%	27	5.4%	27	4.1%	7	6.7%	
Instagram	512	40.9%	220	44.4%	248	38.0%	44	42.3%	
Snapchat	491	39.2%	176	35.5%	266	40.7%	49	47.1%	
Twitter	636	50.8%	217	43.8%	362	55.4%	57	54.8%	
YouTube	621	49.6%	259	52.2%	314	48.1%	48	46.2%	
Telegram	180	14.4%	87	17.5%	81	12.4%	12	11.5%	
Tik-tok	31	2.5%	15	3.0%	15	2.3%	1	1.0%	
None	31	2.5%	7	1.4%	16	2.5%	8	7.7%	
Average time spent on social media?									
1 hour or less	136	10.9%	70	14.1%	58	8.9%	8	7.7%	.032*0
2-4 hours	588	46.9%	232	46.8%	312	47.8%	44	42.3%	
5-7 hours	349	27.9%	120	24.2%	194	29.7%	35	33.7%	
More than 7 hours	180	14.4%	74	14.9%	89	13.6%	17	16.3%	

P: Pearson X^2 test

* $P < 0.05$ (significant)

Figure 1 shows stress and methods to relieve among medical students during COVID-19 pandemic. Most students (96%) had stress, and exact as low as 4% of students had no stress, while 9% of those suffering from stress failed to control it. As for methods used to relieve stress, and sense of loneliness during quarantine of covid pandemic, sleeping was reported by many students (44%), followed by using social media (40%), online gaming (30%), talking (25%), physical exercise (24%), web series (21%), and reading (17%). The least used methods were drawing (7%), working (8%), and singing and writing (9%).

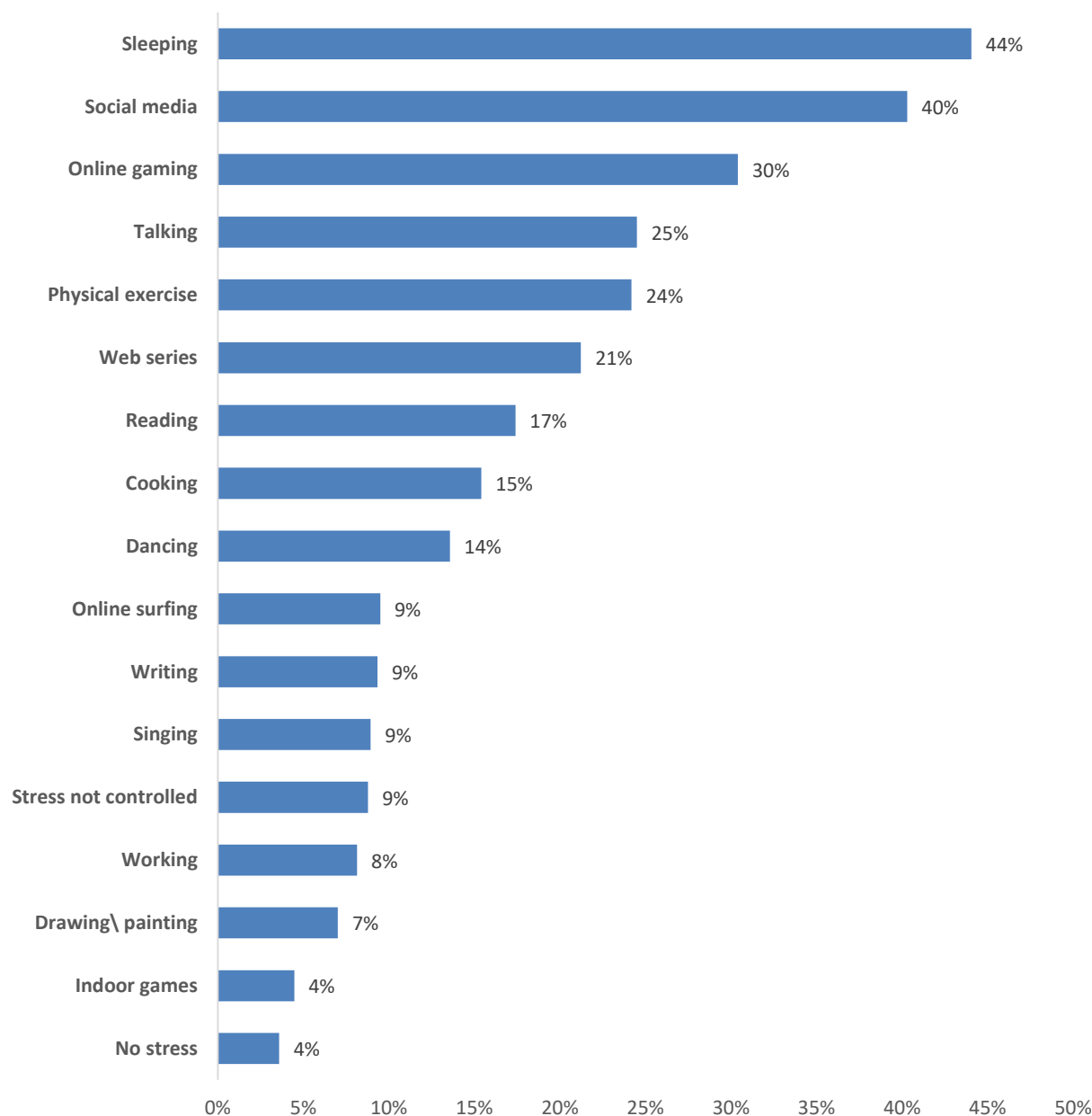


Figure 1 Stress and methods used to relieve among medical students during covid-19 pandemic, Saudi Arabia.

4. DISCUSSION

The current study aimed to evaluate the impact of COVID-19 pandemic on the medical students in different regions in Saudi Arabia, using different parameters including sleeping habits, daily fitness routine, mental health and social support. After disease reporting in Saudi Arabia, inhabitants were only allowed to leave their houses for vital daily needs within their residential area (Alshehri et al., 2020; Alghamdi, 2021). All universities and educational institutions were locked to minimize the COVID-19 outbreak with the activation of online education during the lockdown period (Alshammari et al., 2020; Hui et al., 2020). All applied these measures and other precautionary and preventive measures resulted in much exploration about their expected drawbacks on

students' lives as they shifted to an at-home, virtual learning experience during the COVID-19 outbreak (Alshehri et al., 2020; Alghamdi, 2012).

The current study revealed that online learning was applied for more than 4 hours daily among more than half of the students with more self-education times. Also, about two thirds of the students were satisfied for online classes and only one third of them reported for opportunities to collaborate with my colleagues during online classes. Most students were satisfied regarding the role of online classes and getting higher grades. However, students reported fewer opportunities to collaborate with colleagues, and ask questions during online classes. The most improved skills among medical students with online learning were access and using different types of information sources, time management, multitasking and self-monitoring for academic progress. These findings were all concordant with several studies which assessed educational impact of COVID-19 on students (Gupta & Goplani, 2020; Tartavulea et al., 2020; Ferrel & Ryan, 2020; Radu et al., 2020).

In Saudi Arabia, Khalil et al., (2020) assessed effect of COVID-19 on education process among medical students. Authors found that the online classes were well-organized, and all students agreed that online sessions were time saving and that their performance was improved due to improved arrangement of time; though there were some challenges, including methodological, content perception, technical, and behavioral challenges during sessions and online exams. Most of the preclinical students preferred online learning for the upcoming academic years. As for social and habitual lifestyle effect of COVID-19 on students, the current study disclosed that half of students were satisfied with the utilization of their time during quarantine period. However, negative impacts of the quarantine on social and habitual lifestyle were demonstrated as regard increased body weight among large percentage of the students, poor social connection among half of students, on-engagement in physical exercise among more than third of students. Moreover, sleep disturbances, and poor sleep pattern was evident among large percentage of students.

On literature review, there was high discrepancy regarding this point among different studies. Some of the studies, in accordance with the current study, reported negative drawbacks of COVID-19 on the population in general and students as vulnerable group (Son et al., 2020; Aristovnik et al., 2020; Chandratre, 2020; Akat & Karataş, 2020; de Maio Nascimento, 2020; Burns et al., 2020). Other few studies flaw with reported positive consequences on students social, physical and psychological life (Al-Kumaim et al., 2021; Jakobsson et al., 2020; Office et al., 2020).

Mental health burden of COVID-19 is evident in multiple studies (Center for Disease Control and Prevention, 2021; Antoinette Lee et al., 2007; Mental Health UK, 2021). Concomitant with this finding, the current study revealed increased mental health burden and stress among medical students. However, different coping and methods to control stress and relieve sense of loneliness were utilized by most students including social media use, sleeping, gaming, talking, physical activity, and other manual habits.

5. CONCLUSION

The current study revealed positive impacts of COVID-19 restrictions on education in terms of large acceptance of online classes, an increase in students 'grades. Also, improved students' skills in access are using different types of information sources, time management, self-monitoring for academic progress, and multitasking. Negative impact on social life was established as regard poor social communication, disturbed sleep duration and pattern, and poor engagement in physical activity, and increased body weight. The increased mental burden of COVID-19 among medical students was evident.

There were some limitations in our study as it has focused on medical students in different regions in Saudi Arabia. The sample size was fewer than if it has applied for all population in Saudi Arabia, and there were other sides of life should be investigated.

Authors' contribution

All authors contributed in the selection of the study idea, proposal writing, data collection, data entry and analysis, interpretation of findings, editing the manuscript, and final revision of the article.

Ethical approval

The study was approved by the Biomedical Research and Ethics committee of the Faculty of Medicine, Umm Alqura University (ethical approval codeHAP0-02-K-012-2021-04-663).

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Conflicts of interest

The authors declare that they have no conflict of interest.

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Data and materials availability

All data associated with this study are present in the paper.

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